AUDIO ANALOGUE

soundpleasure

HIGH-END AUDIO ELECTRONICS

HANDCRAFTED IN ITALY

Verdi Cento
Integrated Amplifier

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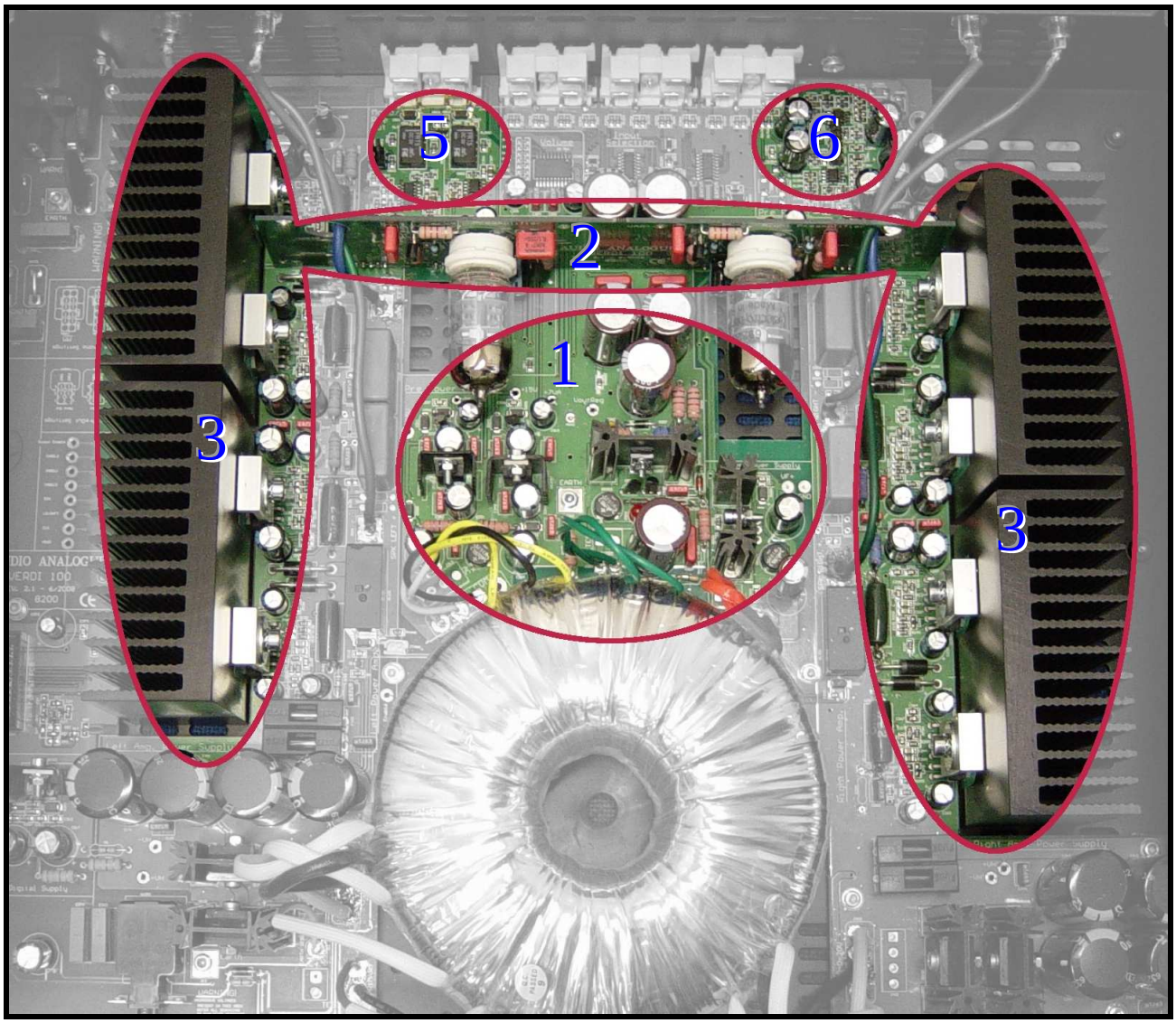
Introduction

Audio Analogue continues in Vacuum Tube/Solid State technology fusion research introducing the Verdi Cento Integrated Amplifier to complete the audio chain begun with RossiniCD Player REV2.0. We believe vacuum tube technology is, even now, very valid in treating the audio signal in a preamplifier stage while leaving to solid state technology the task of the Power stage. So this has been our design philosophy: a vacuum tube preamplifier stage to take advantage of the audio properties of that technology and a solid state power stage as "transparent" as possible. Other important innovations concern the Mono/Pre Out and added use functions.

Unit description



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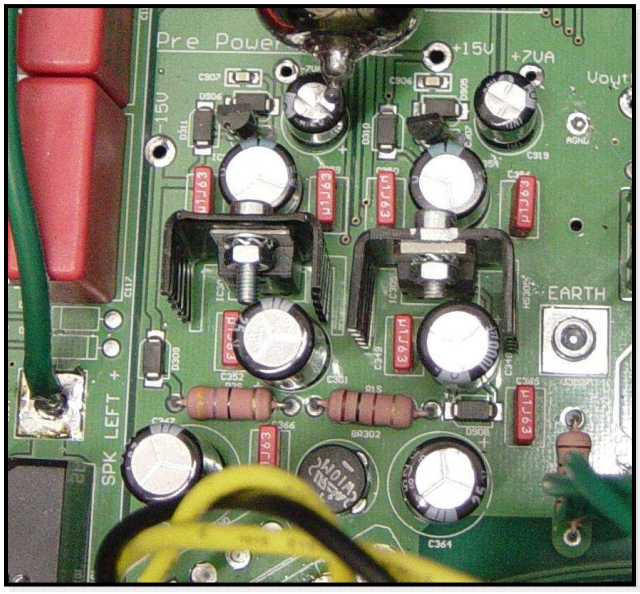
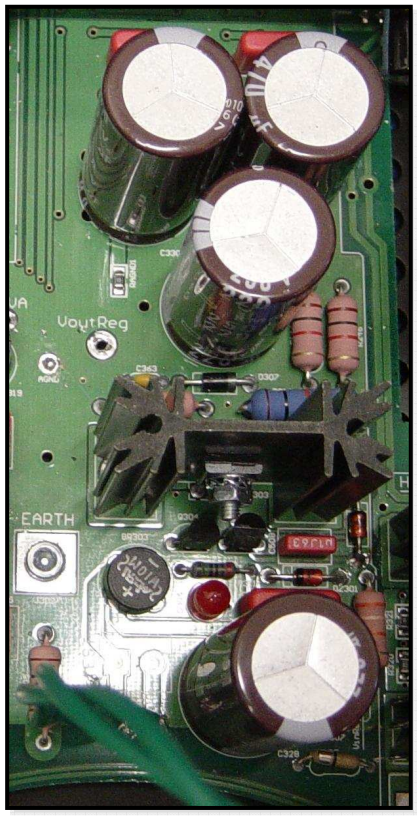
1. Power Supply

The Power supply is the basis of every audio device. The Verdi Cento Integrated amplifier has a very generous toroidal transformer with a dedicated secondary stage for each section of the unit. After each secondary stage there are regulation circuits for every section, let's see it in some detail:

Input Selection/Volume control/PrePhono/RECOUT Powers Supply

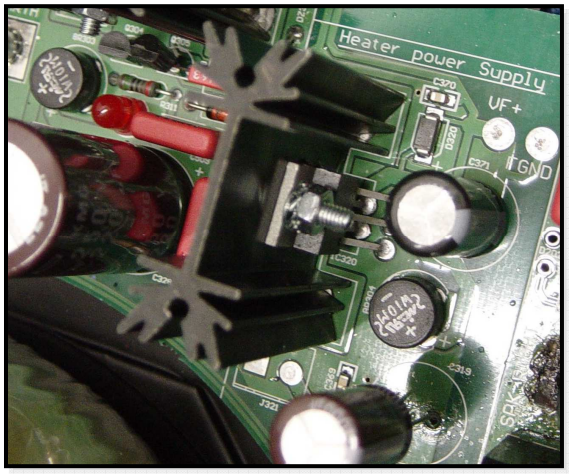


A dedicated secondary stage and 4 voltage regulator provide the supply for the input selection section, volume control section, Rec Out output stage and Pre phono section. The pre Phono power supply is obtained by further filtering of the regulator output voltage via a low time constant RC square.



Vacuum Tube Preamp Power supply

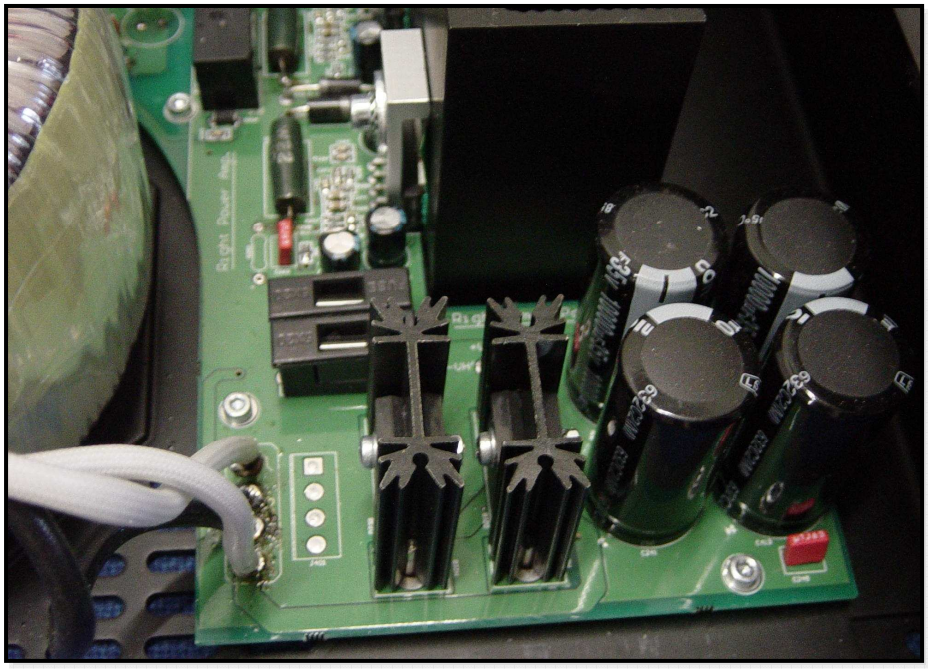
A lot of care has been taken over the Vacuum tube Preamp power supply, because a Vacuum Tube differential pair (that is the structure we have used in the preamp section) will never be well matched enough to completely reject the power supply variations. So we have designed a discrete component voltage regulator to obtain a very stable voltage from the dedicated high voltage secondary. The voltage regulator output is further filtered by two very low time constant RC squares, one for each channel. In such a way we have completely eliminated the 100Hz noise component and using separated RC square for the channels also decreases the crosstalk and increases the "sound stage" definition.



Vacuum Tube Heater

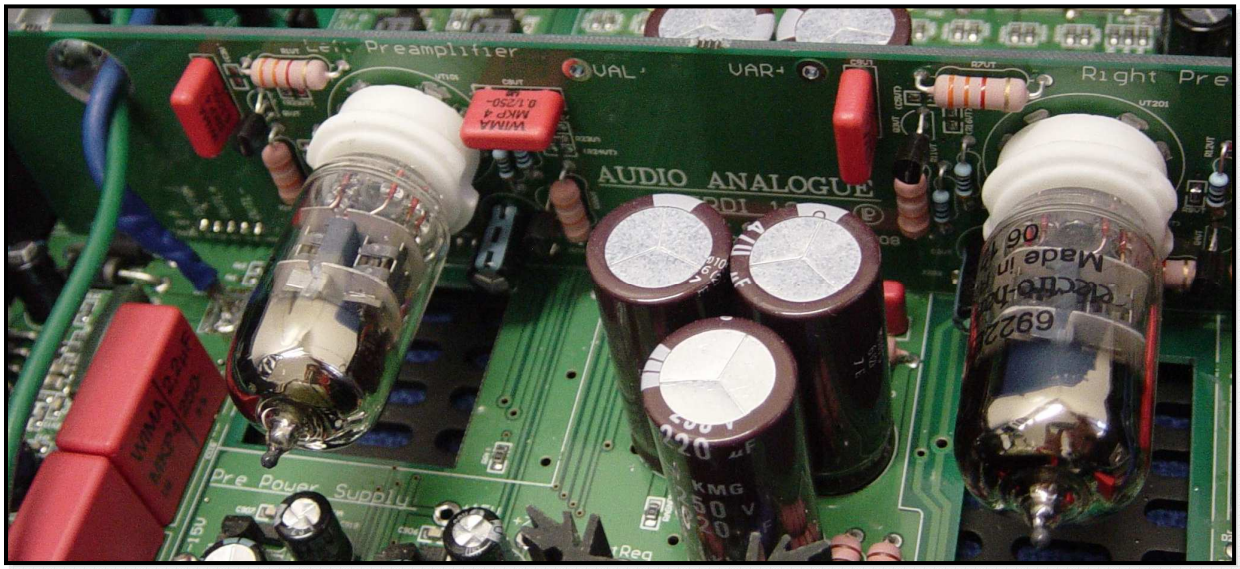
We decided to use a dedicated secondary for the Vacuum tube heater, in this way it is possible to use a linear voltage regulator for the purpose avoiding potentially noisy switching type regulators. The heather voltage has been selected to have the best audio performance from the vacuum tube used.

Power Amps Power Supply



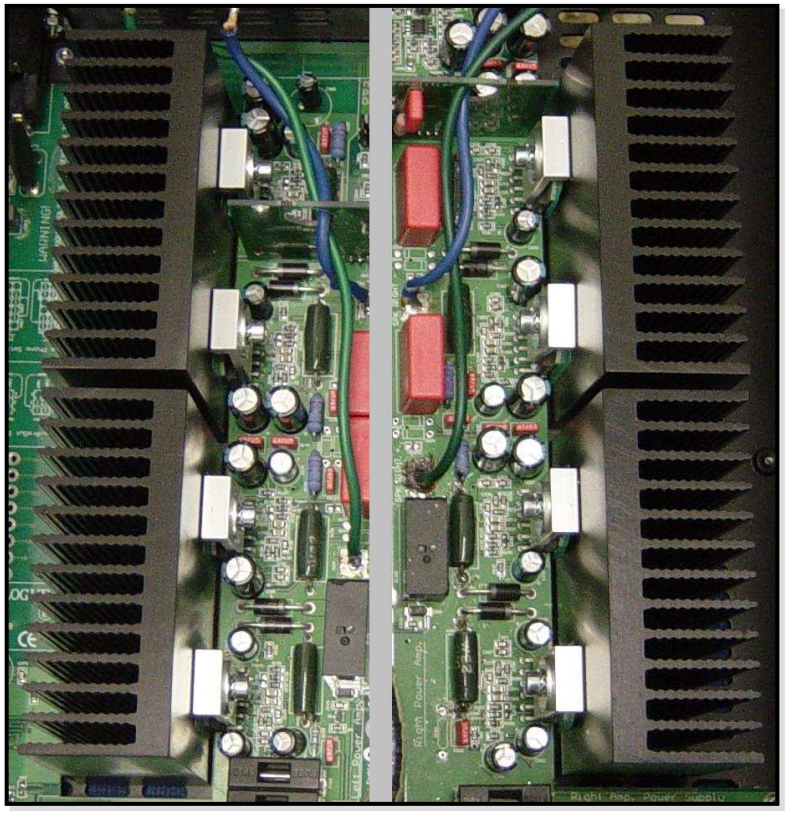
We have dedicated a secondary stage for each power stage channel to decrease the crosstalk and increase the "sound stage" definition. The power amps power supplies take advantage of the high power toroidal transformer and discrete high current rectifier bridge have been used to allow high current peaks. There are four 10000uF capacitors after the bridge for each channel (so 40000uF for each channel!) and a lot of capacity has been distributed close to the Power amps to provide the charge for fast audio responses. The big capacitors and the discrete bridge we have used allow the power stages to perform very highly in bass reproduction. The particular solutions adopted in the power supplies allow the realisation of the high signal to noise ratio expected from the power stage circuit used.

2. Vacuum Tube Preamplifier Stage



The vacuum tube preamp section is the first active stage the audio signal meets in the unit and it is placed after the input selection circuit and the volume control. The Preamp not only has to amplify the signal and adapt the impedances but must also provide two out of phase signals to drive the bridge configured power stage. The unit is based on a "classic" and well-known scheme that we have developed to decrease the output impedance and match the application. Moreover, the fact that it produces zero feedback is its main outstanding characteristic. This means we haven't modified the vacuum tube distortion characteristics in any way and we have let the vacuum tube play "as it is" (remember the "philosophy"…). Nevertheless, the overall distortion is kept low with a higher power stage gain that lets the preamp section work with a low level signal at all times.

3. Power Stage

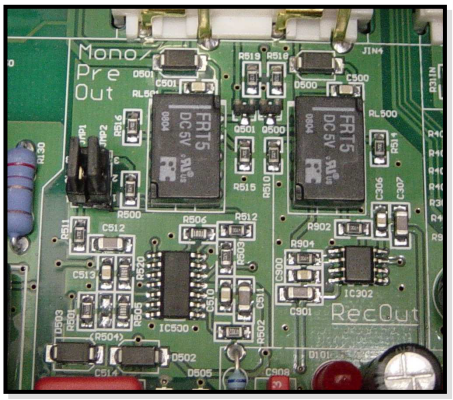


Our purpose was to have a solid state power stage as "transparent" as possible, able to provide/supply 100W in an 8Ohm load. So we have chosen the National Semiconductors LM3886 Power pack as a building block and we have designed a "parallel/bridged" power amplifier. We have decided to use such a component (we are not the first in this, see Jeff Rowland's Concentra Integrated Amplifier as an example) for its overall electrical characteristics (high power capability, high signal/noise ratio…), its reliability and very good overall audio performance. The "parallel/bridged" structure we have used requires 4 LM3886 for each channel and allows sharing of the current demanded by the load among the 4 components. It also allows the use of a lower power supply voltage. In such a way we can obtain more than 100W on an 8Ohm load and more than 170W on a 4Ohm load. The signal to noise ratio obtained is very good: for a load of 8Ohm with a 100W output power we have 99dB with no filter and 106dB A-weighted (with a noise gate of 0-500KHz for both the measurements)!

4. Protections

Every sensitive part inside the unit has been protected to increase the reliability expecially in respect to the temperature increasing due to the high power capability of the product. As an example the LM3886 used in the power stage is a very reliable component (that's one of the reasons why we have choosen it!) protected against shortcircuits and overcurrent and it has two different temperature protection systems: one against instantaneous overtemperature and one against average overtemperature. We have introduced a termal protection into the toroidal transformer too to disconnect the primary if the temperature rises too much. And we have even introduced a thermost close to the power stage heathsink to detect the internal overall temperature and disconnect the loudspeakers if the temperature becomes too high, protecting in such way all the components in the unit.

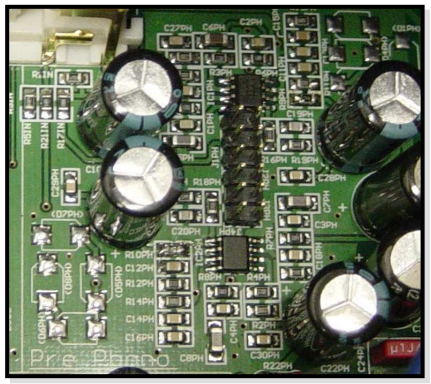
5. Mono/Pre Out



Verdi cento has a Mono/Pre Output. This means the output can be set to be a Mono Out or a Preamplifier output. If you set it as Mono Out you can use it to drive a passive subwoofer. If you set it as preamp out you can use the Verdi Cento preamp Stage to drive a Power Amplifier to realize a "bi amplified" system or just to use the Verdi cento as Preamplifier. The Mono/Pre Out is easily set changing the position of Jumpers on the board with the only simple but essential recommendation of to not do it with the unit on.

6. Pre phono stage

Verdi cento has a pre Phono section able to treat both MC and MM signals. You can easily set the Pre Phono Mode changing the position of Jumpers on the board. We have chosen this kind of Mode selection because it permits you to perform the Pre Phono settings without increasing the track's length and it avoids the low level signal from the cartridge passing through selectors.



7. Functionality

Verdi Cento has a new set of functions that makes it very flexible. Besides the traditional integrated functions it can be set in bypass mode to work as a Power Amplifier. Moreover, you can change the "volume scale" of the integrated amplifier to match it with your loudspeaker's efficiency and have the best volume resolution. Four different scales are available including a 1dB step scale and a scale adjusted for high efficiency loudspeakers! Furthermore, the Verdi Cento has the balance function as well.

All the components used are high quality and low tolerance. The Board that is often a neglected "component" has been designed respecting all possible noise reduction techniques especially for the current return parts and power supply traces.

8. Technical Data

Dimensions (Nota 1)	103 x 448 x 405 mm
	4,0 x 17,6 x 15,9 "
Weight	12,5 Kg
	27,5 Lbs
Line Gain	4,6dB
Power Amp Gain	32,5dB
Phono Gain	60 dB (MM), 80 dB (MC)
Line Input impedance	40KOhm
Phono Input impedance	56KOhm (MM), 100Ohm (MC)
Power on 8Ohm load:	1W @ 0.03% THD + N
	10W @ 0.05% THD + N
	100W @ 0.15% THD + N
	110W @ 0.16% THD + N
Power on 4Ohm load:	10W@0.04% THD + N
	170W@0.3% THD + N
Frequency responce (Note 2)	**150KH**z
Responce to a Square Signal (Note 4)	Vout: 80Vpp
	Rise time: **2.8uS**
Signal Noise Ratio (Note 3)	**106.20 dB (A weighted)**
	99.30dB (No filter)
Noise level (Nota 5)	-100dB
Inputs	**1 Phono Input + 5 Unbalanced Input**
Outputs	**1 tape Out + 1 Pre/Mono Output**

Notes:
Nota 1 - Height x Width x Depth
Nota 2 - Attenuation 0dB, -3dB band
Nota 3 - Attenuation: 0dB A weighted reffered to 8 Ohm load nominal power
Nota 4 - 8 Ohm load nominal power
Nota 5 - Band limits 0Hz-40kHz